Claims:

1. (Currently Amended): A passive alignment fiber optic connection system, comprising:

a connector module having a plurality of fiber optic fibers having ends terminating at a face of said connector module;

a substrate module having a plurality of waveguides having ends terminating at a first face or at a second face of said substrate module to define an input end and an output end which are different from each other;

at least two pins projecting from one of said modules at pin locations;

at least two pin passages within another of said modules at pin locations and through said face thereof, respective said pin passages being sized, shaped and positioned to receive respective said projecting pins, the pin passages and projecting pins being precisely sized to eliminate ~~play~~ movement between the pin passages and projecting pins when the projecting pins are inserted into the pin passages;

said ends of said fiber optic fibers are spaced from one another and from said pin locations of the connector module in accordance with a predetermined alignment pattern, and said ends of said waveguides are spaced from one another and from said pin locations of the substrate module in accordance with said predetermined alignment pattern, whereby each of said respective waveguides optically aligns with each of said respective fibers when said modules are attached together; and

said substrate module includes at least two wafers assembled together, and prior to assembly a first said wafer has said plurality of waveguides positioned thereon, and after assembly a second said wafer opposes said first wafer and accommodates said plurality of waveguides positioned on said first wafer.

2. (Original): The fiber optic connection system in accordance with claim 1, wherein said respective ends of the fiber optic fibers are in center-to-center alignment with said respective ends of the waveguides.

3. (Original): The fiber optic connection system in accordance with claim 1, wherein said respe4ctive ends of the fiber optic fibers are flush with said face of the connector module.

4. (Original): The fiber optic connection system in accordance with claim 1, wherein said respective ends of the waveguides are flush with said face o the substrate module.

5. (Original): The fiber optic connection system in accordance with claim 1, wherein said respective ends of the fiber optic fibers are closely spaced from said respective ends of the waveguides.

6. (Original): The fiber optic connection system in accordance with claim 1, wherein said respective ends of the fiber optic fibers are in contact with said respective ends of the waveguides.

7. (Original): The fiber optic connection system in accordance with claim 1, wherein said face of the connector is generally perpendicular to respective lengths of said fiber optic fibers including said ends of the respective fibers.

8. (Original): The fiber optic connection system in accordance with claim 1, wherein said face of the substrate if generally perpendicular to respective lengths of said waveguides including said ends of the respe4ctive waveguides.

9. (Original): The fiber optic connection system in accordance with claim 1, wherein said respective ends of said fiber optic fibers are closely spaced from and in center-to-center alignment with said respective ends of said waveguides.

10. (Original): The fiber optic connection system in accordance with claim 1, wherein said respective ends of said fiber optic fibers contact said respective ends of said waveguides and are in center-to-center alignment therewith.

11. (Original): The fiber optic connection system in accordance with claim 1, wherein:

said face of the connector is generally perpendicular to respective lengths of said fiber optic fibers including said ends of the respective fibers;

said face of the substrate is generally perpendicular to respective lengths of said waveguides including said ends of the respective waveguides; and

said respective ends of said fiber optic fibers are in center-to-center alignment with said respective ends of said waveguides.

12. (Previously Presented): The fiber optic connection system in accordance with claim 1, wherein said input end of the substrate module ahs a different number of waveguide ends than does said output end of the substrate module.

13. (Original): The fiber optic connection system in accordance with claim 1, wherein said substrate contains no fiber optic fibers.

14. (Original): The fiber optic connection system in accordance with claim 1, wherein said substrate module is devoid of grooves for receiving fiber optic fibers from the connector module.

15. (Previously Presented): The fiber optic connection system in accordance with claim 1, wherein said system has more than one said connector, one said connector is provided for attachment with said input end, and another aid connector is provided for attachment with said output end of the substrate module.

16. (Previously Presented): The fiber optic connection system in accordance with claim 1, wherein said second wafer has a plurality of channels which accommodate said plurality of waveguides when the wafers are assembled together.

17. (Cancelled)

18. (Original): The fiber optic connection system in accordance with claim 16, wherein said substrate contains no fiber optic fibers.

19. (Original): The fiber optic connection system in accordance with claim 18, wherein said substrate is devoid of grooves for receiving fiber optic fibers from the connector module.

20. (Original): The fiber optic connection system in accordance with claim 16, wherein said channels of the substrate contain a filler which accommodates said waveguides.

21. (Currently Amended): A passive alignment fiber optic substrate module, comprising:

a substrate body having a first face and a second face;

a plurality of waveguides which are within said substrate body and which have first ends terminating at said first face and second ends terminating at said second face of the substrate module to define an input end and an output end which are different from each other;

a pin location at said first face, and a pin location at said second face;

said first ends of said waveguides are spaced from one another and from one said pin location and said second ends are spaced from one another and from another said pin location of the substrate module in accordance with respective predetermined alignment patterns etched as accurately as the crystal structure of the substrate material into the substrate body ~~using a photolithographic process~~, which are adapted to coincide with fiber optic fibers and pin locations of another component; and

said substrate body includes at least two wafers assembled together, and prior to assembly a first said wafer has said plurality of waveguides positioned thereon, and after assembly a second said wafer opposes said first wafer and accommodates said plurality of waveguides positioned on said first wafer.

22. (Original): The fiber optic substrate module in accordance with claim 21, wherein said predetermined alignment pattern coincides with an alignment pattern of a connector module having at least two pin locations and a plurality of fiber optic fibers having ends terminating at a face thereof, whereby each of said respective waveguides are adapted to optically align with each respective fiber ends.

23. (Original): The fiber optic substrate module in accordance with claim 21, wherein said alignment pattern is center-to-center alignment.

24. (Original): The fiber optic substrate module in accordance with claim 21, wherein said respective ends of the waveguides are flush with said face of the substrate module.

25. (Original): The fiber optic substrate module in accordance with claim 21, wherein said face of the substrate is generally perpendicular to respective lengths of said waveguides including said ends of the respective waveguides.

26. (Previously Presented): The fiber optic substrate module in accordance with claim 21, wherein said input end of the substrate module has a different number of waveguide ends than does said output end of the substrate module.

27. (Original): The fiber optic substrate module in accordance with claim 21, wherein said substrate contains no fiber optic fibers.

28. (Original): The fiber optic substrate module in accordance with claim 21, wherein said substrate module is devoid of grooves for receiving fiber optic fibers.

29. (Previously Presented): The fiber optic substrate module in accordance with claim 21, wherein said second wafer has a plurality of channels which accommodate said plurality of waveguides when the wafers are assembled together.

30. (Cancelled)

31. (Original): The fiber optic substrate module in accordance with claim 29, wherein said body contains no fiber optic fibers.

32. (Original): The fiber optic substrate module in accordance with claim 29, wherein said channels of the body contain a filler which accommodates said waveguides.

33. (Currently Amended): A method for passive optical alignment of a fiber optic connection system, comprising the steps of:

providing a connector module having a plurality of fiber optic fibers having ends terminating at a face of the connector module and having at least two pin locations;

spacing said ends of the fiber optic fibers and said pin locations in accordance with a predetermined alignment pattern;

assembling, by an assembly procedure separate from said providing step, a substrate module having a plurality of waveguides having ends terminating at a face of the substrate module and having at least two pin locations;

spacing said ends of the waveguides from one another and from said pin locations of the substrate module in accordance with said predetermined alignment pattern;

attaching the connector module and substrate module together in order to thereby automatically optically align each of the respective waveguides with each of the respective fibers when the modules are attached together; and

wherein said substrate module assembling procedure includes:

forming a wafer having a plurality of aligned respective channels chemically etched therein as accurately as the crystal structure of the substrate material;

forming another wafer having a plurality of aligned respective waveguides; and

assembling the two wafers together such that the plurality of aligned respective channels accommodate the plurality of aligned respective waveguides.

34. (Original): The method in accordance with claim 33, wherein said attaching step automatically aligns respective ends of the fiber optic fibers in center-to-center alignment with respective ends of the waveguides.

35. (Previously Presented): The method in accordance with claim 33, wherein said providing and assembling steps result in the ends of the fiber optic fibers being flush with the face of the connector module and the ends of the waveguides being flush with the face of the substrate module.

36. (Original): The method in accordance with claim 33, wherein after said attaching step the respective ends of the fiber optic fibers are closely spaced from the respective ends of the waveguides.

37. (Original): The method in accordance with claim 33, wherein after said attaching step the respective ends of the fiber optic fibers are in contact with said respective ends of the waveguides.

38. (Original): The method in accordance with claim 33, wherein said attachment step results in the respective ends of the fiber optic fibers being closely spaced from and in center-to-center alignment with the respective ends of the waveguides.

39. (Original): The method in accordance with claim 33, wherein the respective ends of the fiber optic fibers contact the respective ends of said waveguides and are in center-to-center alignment therewith.

40. (Cancelled)

41. (Previously Presented): The method in accordance with claim 33, wherein said assembling procedure includes filling the channels of the substrate while accommodating the waveguides.